

# Sharing Data Through The Biological and Chemical Oceanography Data Management Office



---

Gordon and Betty Moore Foundation  
Marine Microbiology Initiative  
January 15, 2020

# Outline

1. Who we are; what we do
  - a. History and mission
  - b. Why share your data
  - c. Supporting the data lifecycle
2. Sharing data through BCO-DMO
  - a. Prepare and submit data files & metadata
  - b. What happens next...
3. Discovery & access of data
4. Tips for successful data sharing
  - a. Data type consideration
  - b. Data formatting tips that speed processing!

Core	Depth cm	pH	alkalinity mmol/kg	Nitrate umol/kg	Chlorophyll mmol
METHOD		electrode	titration	colorimetric	titration
2014 bottom water		7.92	2.32	21.1	544
J2-733-PC 1 - Did not hit bottom (18:24) and was positioned next to PC 2. 22					
	2	7.68	2.08	22.3	546
	6	7.69	2.11	23.8	546
	10	7.71	2.20	25.1	545
	13	7.7	2.22	25.8	547
	16	7.69	2.22	24.7	544
	18	7.71	2.22	24.6	546
J2-733-PC 2 - Did not hit bottom (18:27) and was positioned next to PC 1. 22					
	2	7.69	2.13	21.9	548
	7	7.70			
	11	7.73			
	15	7.70			
	18	7.72			
	20	7.70			
	22	7.72			
J2-733-PC 4 - Hit bottom (18:01) and					
	3	7.67			
	6	7.69			
	8	7.71			
	10	7.75			
	12	7.71			
	14	7.73			
J2-733-PC 6 - Did not hit bottom (19:04)					
	4	7.71			
	7	7.71			



Site Code	Site Code	Deployment Dates
1	Dittliff Point	6/1/16 - 3/22/17
2		3/27/17 - 6/22/17
3		5/29/16 - 3/22/17
4	Cocoloba Cay	3/27/17 - 7/11/17
5		5/29/16 - 10/22/16
6		11/10/16 - 3/22/17
7	Joel's Shoal	3/28/16 - 7/11/17
8		5/29/16 - 10/21/16
9	White Point	10/23/16 - 3/23/17
10		5/29/16 - 10/21/16
11	Europa Bay	10/23/16 - 12/12/16
12		5/29/16 - 10/21/16
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		

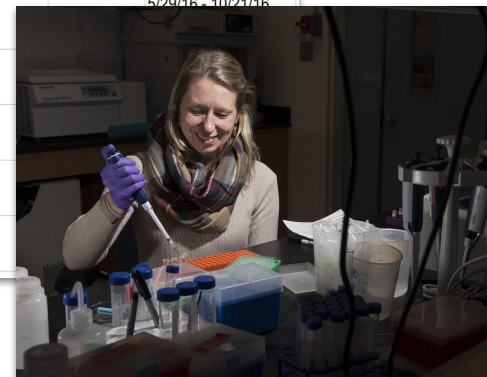


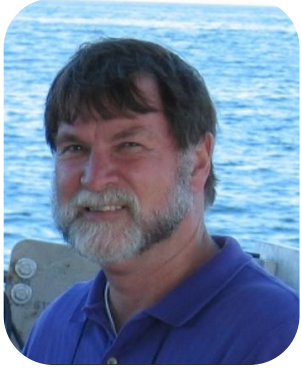
Photo credits: WHOI image bank

# The Biological & Chemical Oceanography - Data Management Office

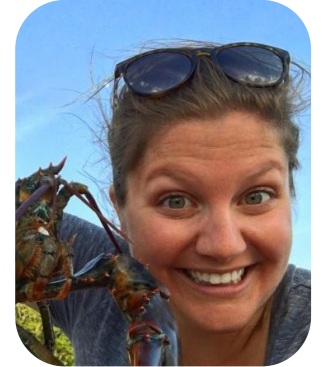
- Established in 2006, through the merging of the data management offices for the NSF-funded U.S. GLOBEC and JGOFS programs.
- BCO-DMO is primarily supported by NSF to provide data management services at no cost to the investigators funded through the same programs that fund BCO-DMO.
- We now manage data from thousands of projects from researchers (PIs) across the U.S. studying a wide variety of oceanographic subdisciplines.



# Who are we?



**Peter Wiebe, Mak Saito, Amber York, Karen Soenen, Nancy Copley**

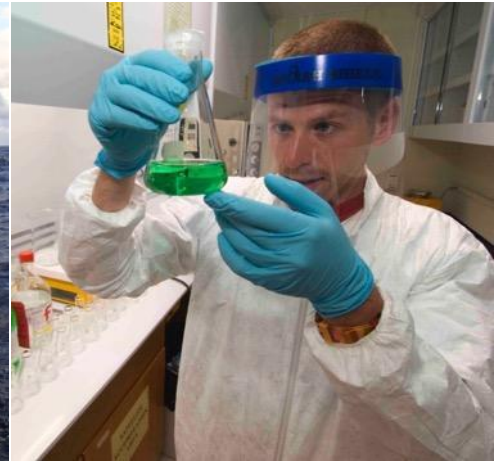
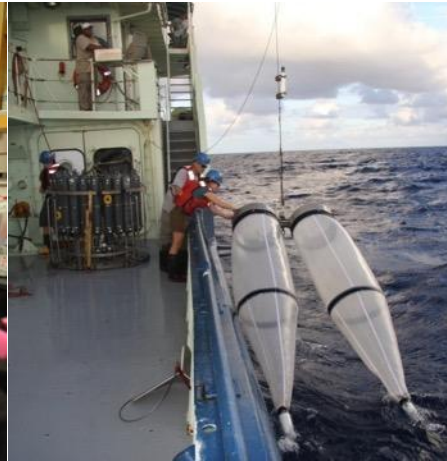


**Danie Kinkade, Adam Shepherd, Shannon Rauch, Mathew Biddle, Tina Haskins**

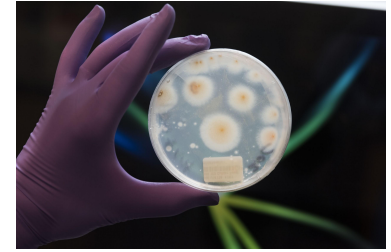


# Mission

To work closely with principal investigators to curate, publish, and serve data and information from federally and privately funded research projects within the ocean sciences.

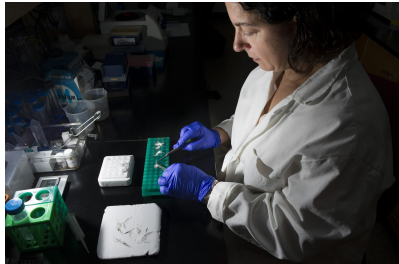


# Why Share Your Data? Benefit to...



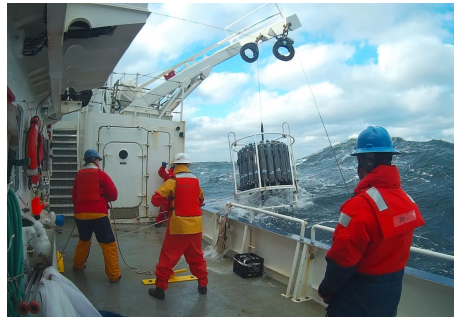
## YOU:

- Credit for your hard work!
- Can increase citations
- Can boost collaborations
- Increases exposure
- Satisfies funder requirements



## Research Community:

- Builds a resource
- Enables new discoveries
- Sparks collaborations
- Allows for transparency and reproducibility of research results



## Society at-large:

- Transparency boosts public confidence in scientific process
- Can contribute to management and policy
- Availability to audiences outside of research (education, general public)

# Making Data ...

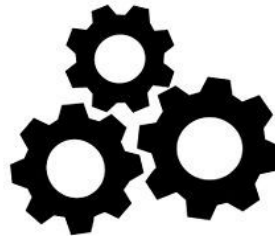
F<sub>indable</sub>



A<sub>ccessible</sub>



I<sub>nteroperable</sub>



R<sub>eusable</sub>



Wilkinson, M.D., et al. (2016) The FAIR Guiding Principles for scientific data management and stewardship. *Scientific Data*, 3, 160018, <https://doi.org/10.1038/sdata.2016.18>

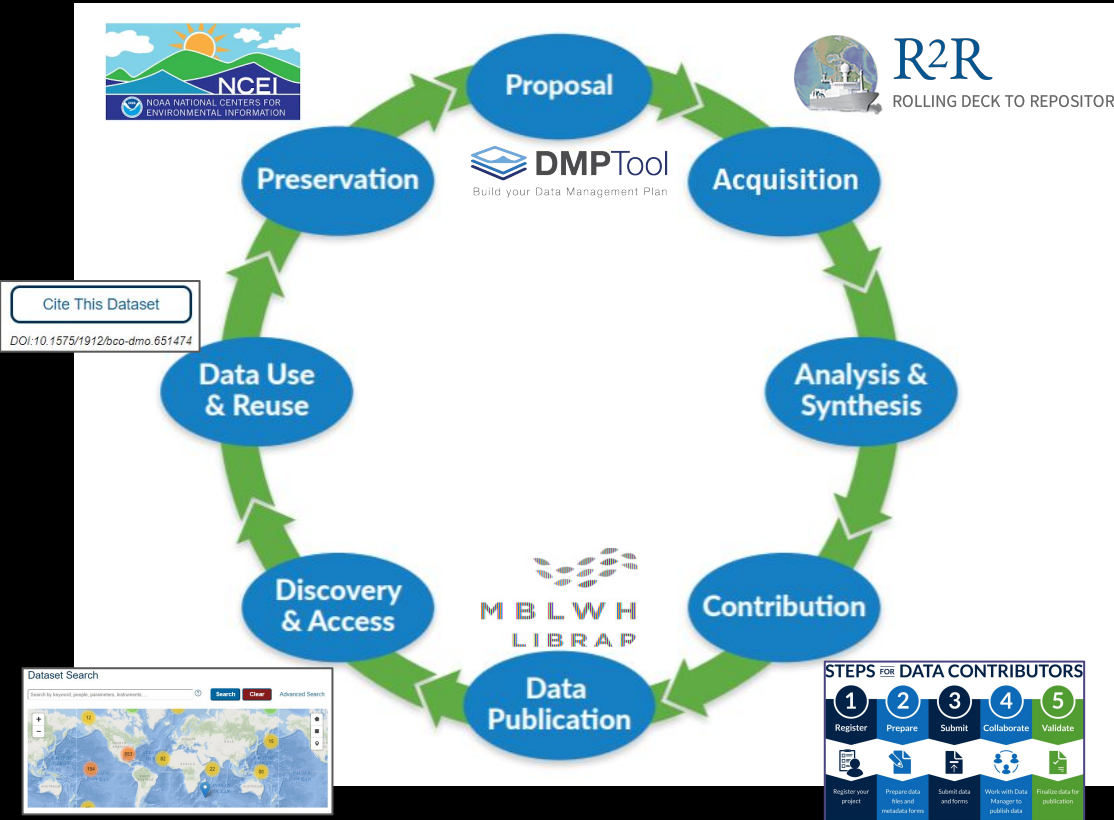
**F**indable: Data are linked to descriptive persistent metadata.

**A**ccessible: Data and metadata are open, free, and machine accessible.

**I**nteroperable: Data and metadata are standardized and use vocabularies.  
Data points to related metadata.

**R**eusable: Metadata are rich, and employ usage licenses, provenance, and community standards.

# BCO-DMO supports data stewardship throughout the data lifecycle



- Provide guidance on data formatting and standards;
- Apply gross QC (e.g lat/lon checking);
- Capture and record metadata;
- Make data and metadata available online (restricting access as appropriate);
- Publish with digital object identifiers (DOIs) and recommended citations.
- Ensure final archive in appropriate national data center



# BCO-DMO Data Catalog

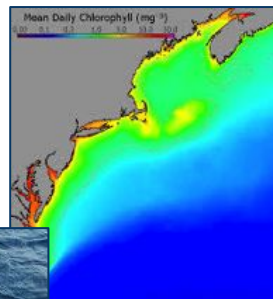
DATASETS = >9000  
CONTRIBUTORS = >2500  
PROJECTS = >1000

- Biological
- Chemical
- Biogeochemical
- Physical
- Geophysical

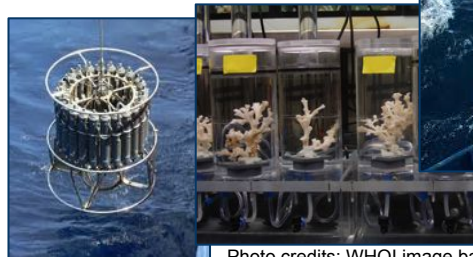
- ASCII Text (tabular)
- Binary (e.g., NetCDF)
- Images
- Acoustics
- Application (e.g., Matlab)
- Links to other data (e.g., NCBI accessions)



- Molecular to Megafaunal
- Local to Global
- Discrete to synoptic



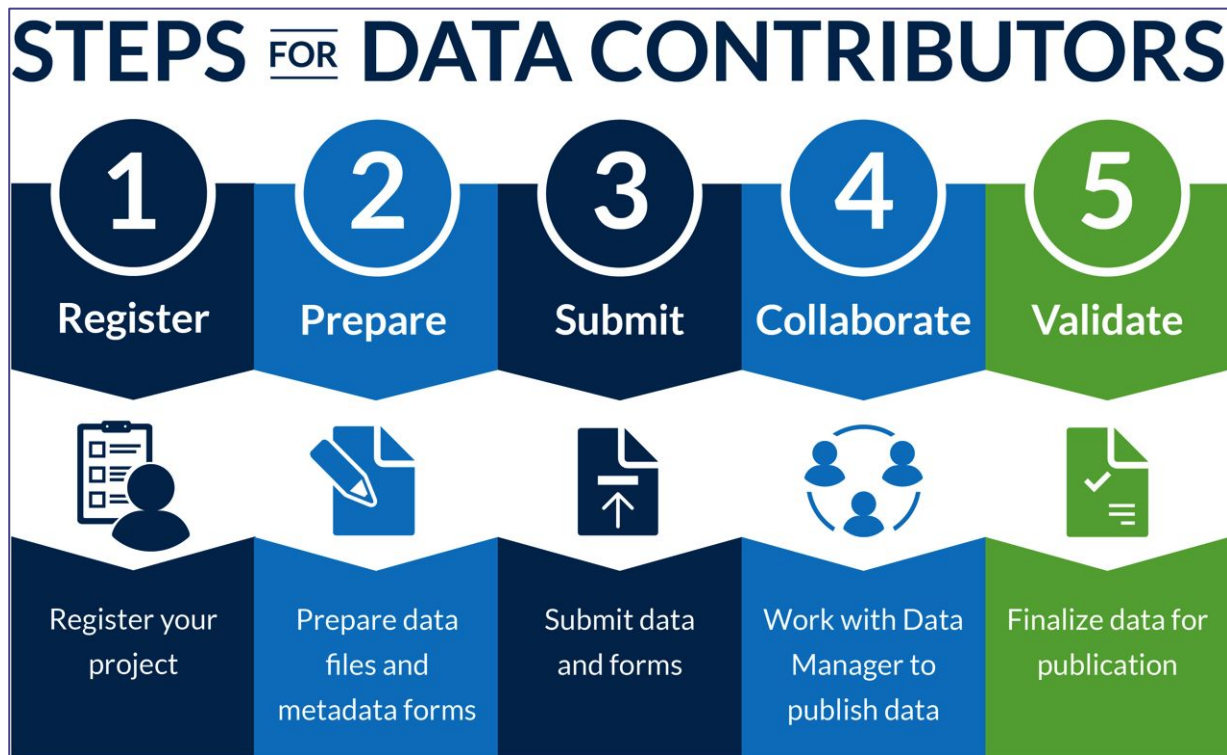
data.xls												
A	B	C	D	E	F	G	H	I	J	K	L	
1	Site	Date	Plot	Species	Weight	Adult		Rodent Trapping	3/15/2010			
2	DeepWell	2/13/2010		1 DIPO	12.1 j		Site	Plot	Adult	RodentSp	Weight	
3	Deep Well	Feb-10		2 Pero	13.22 j		DW		1 y	Pero		
4	rioSalado	2/13/2010	1a	pero	16 N		RS		2 j	PERO		
5	rioSalado		1*	Clegap	18.92	gut away	RS		3 n	Clegap		escaped
6				Mean1	15.06							
7												
8												
9												
10												
11												
12	Rodent Trapping		MJK & ALN	10-Apr-10								
13	Site	Plot	Adult	Species	grams	Comments						
14	deep well	1 y		woodrat	13							
15	riosalado	2 y		PERO	24.5							
16	riosalado	3 y		Clegap	91							
17												
18												
19												
20												
N 4 Sheet1												



- *In situ*
- Laboratory
- Remotely sensed
- Synthetic/derived

- Parameters = > 1400
- From Abundance to Zenith Sun Angle

# Sharing Your Data Through BCO-DMO



# Prepare to Share: Data

Submit data in the format most appropriate for your community.

BCO-DMO transforms data into a tabular version (csv, tsv).

For videos, images, and other formats not suitable to tsv/csv, we will work with you to arrive at the best data representation possible.

```
1 unix_timestamp,lat,lon,chl,CDOM,phycoer
2 UTC,degrees_north,degrees_east,RFU,RFU,
3 2015-05-20T21:32:40Z,20.0382,-155.83077
4 2015-05-20T21:42:40Z,20.03822,-155.8307
5 2015-05-20T21:42:40Z,20.03822,-155.8307
6 2015-05-20T21:42:40Z,20.03822,-155.8307
7 2015-05-20T21:32:40Z,20.0382,-155.83077
8 2015-05-20T21:42:40Z,20.03822,-155.8307
9 2015-05-20T21:42:40Z,20.03822,-155.8307
10 2015-05-20T21:42:40Z,20.03822,-155.8307
11 2015-05-20T21:32:40Z,20.0382,-155.83077
12 2015-05-20T21:42:40Z,20.03822,-155.8307
13 2015-05-20T21:52:40Z,20.03821,-155.8307
14 2015-05-20T21:42:40Z,20.03819,-155.8307
15 2015-05-20T23:51:22Z,20.03821,-155.8308
16 2015-05-21T00:01:22Z,20.03819,-155.8308
17 1970-01-01 2015-05-21T00:11:22Z,20.0382,-155.83077
18 2015-05-21T00:21:22Z,20.03821,-155.8307
19 2015-05-21T00:31:22Z,20.03822,-155.8307
20 1970-01-01T00:00:00Z,,0,0,0,0
21 2015-05-21T01:20:18Z,20.03823,-155.8307
22 2015-05-21T01:30:18Z,20.03825,-155.8307
23 2015-05-21T01:40:18Z,20.03824,-155.8307
```

Same data type;  
same headers;  
are combined if  
appropriate

/BCO-DMO/MAGI/c3 ---- Level 0

Directory Documentation Download & Other Operations

Level 0 Next Level Flat Listing

```
# Fluorescence (C3) data from the Honey Badger (G3) Wave Glider
# P.I. Tracy Villareal
# version 7 Jul 2017
=====
ISO_DateTime_UTC      lat      lon      chl      CDOM      phycoerythrin
-----
2015-05-20T21:32:40Z  20.03820  -155.83077  48.51   49.11     334.0
2015-05-20T21:42:40Z  20.03822  -155.83077  38.89   1185.51   224.5
2015-05-20T21:52:40Z  20.03821  -155.83076  29.58   1190.79   223.83
2015-05-20T23:41:22Z  20.03819  -155.83073  74.4    95.2
2015-05-20T23:51:22Z  20.03821  -155.83080  10.32   29.96     58.32
2015-05-21T00:01:22Z  20.03819  -155.83080  9.48    32.36     53.56
2015-05-21T00:11:22Z  20.03820  -155.83077  10.36   35.64     53.52
2015-05-21T00:21:22Z  20.03821  -155.83079  10.8    34.4      58.08
2015-05-21T00:31:22Z  20.03822  -155.83077  11.16   35.04     57.6
2015-05-21T01:20:18Z  20.03823  -155.83078  77.6    74.4      95.2
2015-05-21T01:30:18Z  20.03825  -155.83078  11.04   35.72     52.0
2015-05-21T01:40:18Z  20.03824  -155.83076  10.28   31.88     52.0
2015-05-21T01:50:18Z  20.03822  -155.83077  10.2    33.04     53.64
2015-05-21T02:00:18Z  20.03831  -155.83079  11.2    34.72     53.6
2015-05-21T02:10:18Z  20.03830  -155.83079  0.84    31.76     53.6
```

One Excel file w/ separate data types: these are split into different datasets

urchins.xlsx - Excel

	A	B	C	D	E	F	G
1	trial	date_local	time_local	site	lat	lon	survivors
2	1	2007-05-18	11:55	Rocas_Gordon	-0.56596	-90.14065	3
3	1	2007-05-18	11:56	Rocas_Gordon	-0.56596	-90.14065	3
4	1	2007-05-18	11:57	Rocas_Gordon	-0.56596	-90.14065	3
5	1	2007-05-18	11:58	Rocas_Gordon	-0.56596	-90.14065	3
6	1	2007-05-18	11:59	Rocas_Gordon	-0.56596	-90.14065	3
7	1	2007-05-18	12:00	Rocas_Gordon	-0.56596	-90.14065	3
8	1	2007-05-18	12:01	Rocas_Gordon	-0.56596	-90.14065	3
9	1	2007-05-18	12:02	Rocas_Gordon	-0.56596	-90.14065	3
10	1	2007-05-18	12:03	Rocas_Gordon	-0.56596	-90.14065	3
11	1	2007-05-18	12:04	Rocas_Gordon	-0.56596	-90.14065	3
12	1	2007-05-18	12:05	Rocas_Gordon	-0.56596	-90.14065	3
13	1	2007-05-18	12:06	Rocas_Gordon	-0.56596	-90.14065	3
14	1	2007-05-18	12:07	Rocas_Gordon	-0.56596	-90.14065	3

/BCO/Trophic\_Cascades/urchin\_survivorship

Directory Documentation Download & Other Operations

Level 0 Next Level Flat Listing

```
# survivors from sea urchin tethering experiments
# J. Mitman, F. Smith (Brown U)
# version: 2016-01-15
=====
trial_date_local      time_local_yrday      ISO_DateTime_UTC      survivors
-----
1 2007-05-18 11:55 2007-05-18T11:55:00.000 3
1155 2007-05-18 11:56 2007-05-18T11:56:00.000 3
1156 2007-05-18 11:57 2007-05-18T11:57:00.000 3
1157 2007-05-18 11:58 2007-05-18T11:58:00.000 3
1158 2007-05-18 11:59 2007-05-18T11:59:00.000 3
1159 2007-05-18 12:00 2007-05-18T12:00:00.000 3
1200 2007-05-18 12:01 2007-05-18T12:01:00.000 3
1201 2007-05-18 12:02 2007-05-18T12:02:00.000 3
1202 2007-05-18 12:03 2007-05-18T12:03:00.000 3
1203 2007-05-18 12:04 2007-05-18T12:04:00.000 3
1204 2007-05-18 12:05 2007-05-18T12:05:00.000 3
1205 2007-05-18 12:06 2007-05-18T12:06:00.000 3
1206 2007-05-18 12:07 2007-05-18T12:07:00.000 3
1207 2007-05-18 12:08 2007-05-18T12:08:00.000 3
1208 2007-05-18 12:09 2007-05-18T12:09:00.000 3
```

# Prepare to Share: Metadata

Metadata: describes your data (who, what, where, when and how it was collected. Includes funding sources, instrumentation, etc.).

Metadata templates are available on our Resources page help guide you in the types of metadata needed to describe your project output.

The screenshot displays the BCO-DMO (Biological and Chemical Oceanography Data Management Office) website. The top navigation bar includes links for DATA, RESOURCES (highlighted with a red circle), and ABOUT US, along with a search bar. The main content area is divided into two columns. The left column features a 'DATABASE' table with counts for various categories and a 'CONTRIBUTE DATA' section with links to 'Getting started', 'FAQs', and 'Quick Start Guide (pdf)'. Below this is a 'Metadata Forms (.rtf files)' section with links to 'Program Metadata Form', 'Project Metadata Form', and 'Deployment Metadata Form'. The right column contains the article 'How to Get Started Contributing Data', which includes instructions on data contribution and links to 'How to Register a Project', 'How to Contribute Deployments', and 'How to Contribute Data' (all three links are circled in red). A large orange arrow points from the 'How to Contribute Data' link to a 'Dataset Metadata Submission Form' overlay on the right. This form includes fields for Dataset Name, Dataset Description, Originating PI name and contact information, Co-PI name(s) and contact information, and ORCID information.

DATABASE	
Programs	44
Projects	1,116
Deployments	2,924
Platforms	603
Datasets	9,490
Instruments	490
Parameters	1,420
People	2,784
Affiliations	601
Funding	94
Awards	2,091

**CONTRIBUTE DATA**

**Getting started**

- » [How-to Guide](#)
- » [FAQs](#)
- » [Quick Start Guide \(pdf\)](#)

**Metadata Forms (.rtf files)**

- » [Program Metadata Form](#)
- » [Project Metadata Form](#)
- » [Deployment Metadata Form](#)

**How to Get Started Contributing Data**

This page describes the process for contributing metadata to the BCO-DMO data system. If you would like to discuss your data, please [contact us](#). For funded projects, please be prepared to provide the following information:

» For a complete overview of the data contribution process, please see our [Quick Start Guide](#) (PDF). Additional information is available on the [BCO-DMO website](#).

**I. Should you contribute data to BCO-DMO?**

You should contribute data to BCO-DMO if your project is funded by the Division of Polar Programs' Antarctic Sciences' Biological and Chemical Oceanography / Ecosystems Program. BCO-DMO staff members will manage the data and metadata contributed to BCO-DMO are in compliance with the BCO-DMO policy. To contribute data to BCO-DMO, please see the BCO-DMO website.

If your project is funded by another source: we have a separate policy.

**II. How to contribute data and metadata**

All datasets submitted to BCO-DMO should be submitted in Rich Text Format (.rtf) files that are compatible with Microsoft Word. Each form can be found below.

- [How to Register a Project](#)
- [How to Contribute Deployments](#)
- [How to Contribute Data](#)

**Dataset Metadata Submission Form**

**BCO-DMO**  
Dataset Metadata Submission Form

All data should be reported in table form. For full instructions, see our "See How to Get Started" page: <http://www.bco-dmo.org/how-get-started>. Please send your completed form or questions to [info@bco-dmo.org](mailto:info@bco-dmo.org).

**Dataset Name** [ Preferred short name for the dataset (preferably 30 characters or less) ]

**Dataset Description:** [ Brief sentence describing these data (preferably 60 characters or less) ]

**Originating PI name and contact information:**

**Name:**

**Email:**

**Phone:**

**Mailing Address:**

**ORCID:** [ If you don't currently have an ORCID number, you can register for one at <https://orcid.org/register>. ORCID's are unique persistent identifiers assigned to individuals to enable easy disambiguation and ensure proper credit for work. It is free to register. ]

**Affiliation/Institution during data acquisition:**

**Co-PI name(s) and contact information:** [ Contact information for Co-PIs. Repeat as necessary ]

**Name:**

**Email:**

**Phone:**

**Mailing Address:**

**ORCID:** [ If you don't currently have an ORCID number, you can register for one at <https://orcid.org/register>. ORCID's are unique persistent identifiers assigned to individuals to enable easy disambiguation and ensure proper credit for work. It is free to register. ]

**Affiliation/Institution during data acquisition:**



# Prepare to Share: Metadata

The contents of your metadata form are directly used to populate the public dataset landing page.

Allows your data to be discovered, understood, and re-used by others.

The screenshot shows the BCO-DMO dataset landing page for 'Wave Glider - Fluorescence - C3'. The page includes a sidebar with a database overview, a main content area with a map and project details, and a 'Contribute Data' section. The project details include the title, spatial and temporal extent, project description, principal investigator, co-principal investigator, contact information, version date, restricted status, validated status, current state, data URL, and a description of the fluorescence data. The 'Contribute Data' section includes links to the Program Metadata Form, Project Metadata Form, Deployment Metadata Form, and Dataset Metadata Form. The 'Description' section provides a detailed overview of the dataset, including the AUV Honey Badger (Wave Glider model V2) and the MAGI project. The 'Acquisition Description' section details the data collection process, including the use of two float-mounted Turner Designs C3<sup>TM</sup> Submersible Fluorometers and the challenges of biofouling. The 'Processing Description' section notes that no calibration was deemed useful due to the duration of the mission and the nature of the questions asked. The page also includes a 'Cite This Dataset' button and a 'Get Data' button.

BCO-DMO dataset landing page

## Dataset Metadata Form

**BCO-DMO**  
Dataset Metadata Submission Form

All data should be reported in table form.  
For full instructions, see our "See How to Get Started" page: <http://www.bco-dmo.org/how-get-started>  
Please send your completed form or questions to [info@bco-dmo.org](mailto:info@bco-dmo.org)

**Dataset Name** [ Preferred short name for the dataset (preferably 30 characters or less) ]

**Dataset Description** [ Brief sentence describing these data (preferably 60 characters or less) ]

**Originating PI name and contact information:**  
Name: \_\_\_\_\_  
Email: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Mailing Address: \_\_\_\_\_

**ORCID:** [ If you don't currently have an ORCID number, you can register for one at <https://orcid.org/register>. ORCIDs are unique persistent identifiers assigned to individuals to enable easy disambiguation and ensure proper credit for work. It is free to register. ]

**Affiliation/Institution during data acquisition:** \_\_\_\_\_

Dataset Name

Dataset Description

Methodology

Sampling and analytical procedures



# Prepare to Share: Metadata Considerations

- How were the data generated?
  - How were samples collected?
  - How were they processed and analyzed?
    - Methods - include references and citations
    - Instruments - include manufacturer and model; as well as calibration information! (for both lab instruments and shipboard instruments)
    - Be specific; e.g. describe all the sensors on the CTD (not just "CTD")
- Describe the quality control
  - Replicate samples, inter-comparisons, reference materials used
- What software or scripts did you use?
  - Are they publicly accessible?
  - Modeling project? Describe the inputs, parameters, conditions, etc.

# Submit Data and Metadata

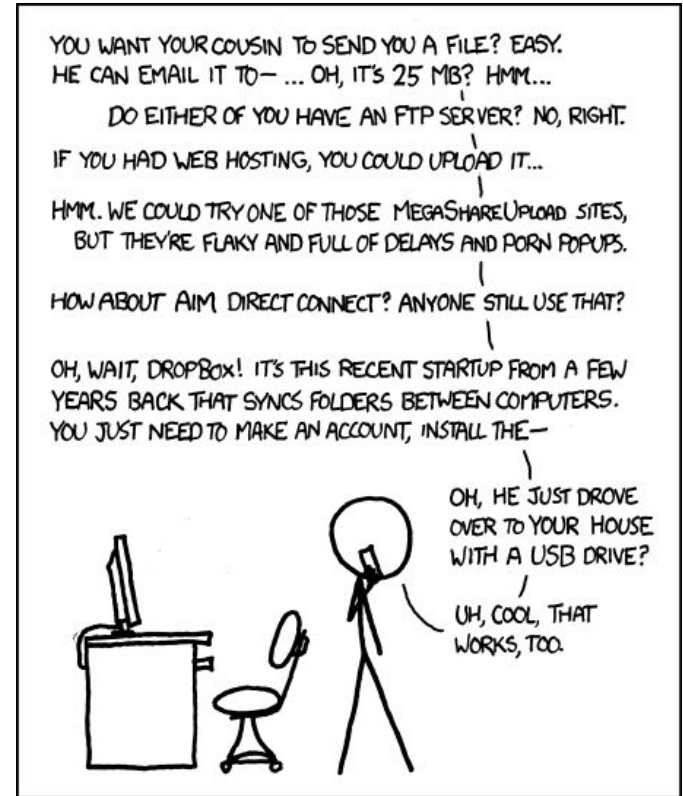
Email metadata forms and data files

[info@bco-dmo.org](mailto:info@bco-dmo.org)

Identify your MMI Project




Talk to us if data are too large for email



I LIKE HOW WE'VE HAD THE INTERNET FOR DECADES, YET "SENDING FILES" IS SOMETHING EARLY ADOPTERS ARE STILL FIGURING OUT HOW TO DO.

# Collaborate and Validate



AN	AO	AP	AQ	AR	AS	AT
Time (minute)	E	D	C.T.	C.O.	C.E.	notes
2.13	X					
2.13						
3.28	X		X			
4.18	X					
6	XX					
8.06	X					
9.18	X					
12.16			X			
13.11	X					
16.06	X					moved out
15.20			X			
19.1	X					
21.05	XX					
23.08			X			
23.08	X					
25.13	X					moved out
24.1				XX		
36.26	XXX					
40.15	X					moved out
41.12	X					
41.12			X			
46.12	XXX					
49.13	X					
53.19			X			
54.13			X			

## /BCO-DMO/MedusanFeeding

Directory Documentation Downloads

Level 0 Next Level Flat Listing

# Medusae Predator-Prey Interactions  
# S. Colin  
# Version 1 March 2017

Cnidaria species  
Cassiopea  
food\_type  
Artemia  
individual  
7

video\_id  
Clip006

time	evaded	ingested	tentacles
0:14:09	XXX	nd	nd
0:31:18	XXX	nd	nd

video\_id  
Clip009

time	evaded	ingested	tentacles
0:13:15	nd	nd	nd
0:14:26	X	nd	nd
0:20:19	XX	nd	nd
0:21:14	X	nd	nd
0:22:00	nd	nd	nd
0:22:29	X	nd	nd

## BCO-DMO

Biological & Chemical Oceanography Data Management Office

DATA RESOURCES ABOUT US

Enter search terms


### DATABASE

New Entry

Programs 45  
Projects 1,116  
Deployments 2,924  
Platforms 603  
Datasets 9,490  
Related Resources  
Instruments 490  
Parameters 1,420  
People 2,784  
Affiliations 601  
Funding 94  
Awards 2,091  
Contact Status 270  
Archive 1,215

Account: dkinkade  
Logout

### Geospatial Access



### Dataset: Capture efficiency of scyphomedusae

View Edit Request a DOI Delete Revisions GCMD DIF Record Add new dataset Copy Contact Status Node Queues

Linked Data URI: <http://lod.bco-dmo.org/id/dataset/683750>

Get Data

DOI:10.1575/1912/bco-dmo.683750.1

Temporal Extent: 2015 - 2015

Project: RUI: Collaborative Research: What's their impact?: Quantification of medusan feeding mechanics as a tool for predicting medusan predation (Medusan Feeding Mechanics)

Principal Investigator: Dr Sean Colin (Roger Williams University, RWU)

BCO-DMO Data Manager: Hannah Ake (Woods Hole Oceanographic Institution, WHOI BCO-DMO)

Version: 1

Version Date: 2017-03-01

Reviewed: No

Validated: Yes

Current Status: Final no updates expected

BCO-DMO Issue Tracking ID: <http://redmine.bco-dmo.org/issues/1927>

Data URL:  
[http://dmoserv3.bco-dmo.org/g/serv/BCO-DMO/Medusan\\_Feeding\\_Mechanics/medusae\\_interactions.html%0%7Bdir=dmoserv3.whoi.edu/g/dir/BCO-DMO/Medusan\\_Feeding\\_Mechanics/info=dmoserv3.bco-dmo.org/g/info/BCO-DMO/Medusan\\_Feeding\\_Mechanics/medusae\\_interactions%7D](http://dmoserv3.bco-dmo.org/g/serv/BCO-DMO/Medusan_Feeding_Mechanics/medusae_interactions.html%0%7Bdir=dmoserv3.whoi.edu/g/dir/BCO-DMO/Medusan_Feeding_Mechanics/info=dmoserv3.bco-dmo.org/g/info/BCO-DMO/Medusan_Feeding_Mechanics/medusae_interactions%7D)

Dataset Title: Raw capture efficiency data of scyphomedusae from video analysis collected in Woods Hole, MA beginning in 2015.

Brief Description: Raw capture efficiency data of scyphomedusae from video analysis.

Abstract:  
Raw capture efficiency data of scyphomedusae from video analysis collected in Woods Hole, MA beginning in 2015.

# Data Publication

Once data & metadata are validated by the submitter, a Digital Object Identifier (DOI) is assigned to the dataset.

This makes it easier to cite the dataset and discover it (e.g. from a publication to the repository).

**BCO-DMO**  
Biological & Chemical Oceanography Data Management Office

DATARESOURCESABOUT US

Enter search terms

**DATABASE**

Programs	39
Projects	917
Deployments	2,736
Platforms	578
<b>Datasets</b>	<b>9,168</b>
Instruments	469
Parameters	1,414
People	2,493
Affiliations	557
Funding	87
Awards	1,736

**GEOSPATIAL ACCESS**

**CONTRIBUTE DATA**

**Getting started**

- » How-to Guide
- » FAQs

**Metadata Forms** (.rtf files)

- » Program Metadata Form
- » Project Metadata Form

**Dataset: Carbon flux**

Get Data

Spatial Extent: N:24.94972 E:-80.45361 S:24.94972 W:-80.45361  
Temporal Extent: 2013-05-01

**Cite This Dataset**

DOI:10.1575/1912/bco-dmo.685952

<b>Project:</b> Testing the sponge-loop hypothesis for Caribbean coral reefs (sponge-loop)
<b>Principal Investigator:</b> Christopher Finelli (University of North Carolina - Wilmington, UNC-Wilmington)
<b>Co-Principal Investigator:</b> Steven McMurray (University of North Carolina - Wilmington, UNC-Wilmington) Dr Joseph Pawlik (University of North Carolina - Wilmington, UNC-Wilmington)
<b>Contact:</b> Steven McMurray (University of North Carolina - Wilmington, UNC-Wilmington)
<b>BCO-DMO Data Manager:</b> Nancy Copley (Woods Hole Oceanographic Institution, WHOI BCO-DMO)
<b>Version Date:</b> 2017-03-27
<b>Restricted:</b> No
<b>Validated:</b> Yes
<b>Current State:</b> Final no updates expected
<b>Data URL:</b> <a href="https://www.bco-dmo.org/dataset/685783/data">https://www.bco-dmo.org/dataset/685783/data</a>

**Carbon flux for the Caribbean giant barrel sponge *Xestospongia muta* (Sponge-loop)**

Expand/Collapse All

# Data Publication

Suggested citation format  
and license information is  
provided, facilitating  
attribution

The screenshot shows the BCO-DMO (Biological & Chemical Oceanography Data Management Office) website. The header includes the BCO-DMO logo and navigation links for DATA, RESOURCES, and ABOUT US. A search bar is located in the top right corner. The main content area displays the 'Dataset: Carbon flux' page. On the left, a sidebar lists various categories with counts: Programs (39), Projects (917), Deployments (2,736), Platforms (578), Datasets (9,168), and Instruments (469). The main content area features a map of the Caribbean region with a red dot indicating the location of the dataset. A 'Cite This Dataset' button is visible in the top right of the main content area. A 'Data Citation' pop-up window is overlaid on the map, providing the following information:

**Data Citation:**

Finelli, C., Pawlik, J., McMurray, S. (2017) Carbon flux for the Caribbean giant barrel sponge *Xestospongia muta* (Sponge-loop). Biological and Chemical Oceanography Data Management Office (BCO-DMO). Dataset version 2017-03-27 [if applicable, indicate subset used]. doi:10.1575/1912/bco-dmo.685952 [access date]

**Terms of Use**

All data sets are licensed under a [Creative Commons Attribution 4.0 International License \(CC BY 4\)](#). Per the CC BY 4 license it is understood that any use of the data set will properly acknowledge the individual(s) listed above using the suggested data citation. If you wish to use this data set, it is highly recommended that you contact the original principal investigator(s) (PI). Should the relevant PI be unavailable, please contact BCO-DMO ([info@bco-dmo.org](mailto:info@bco-dmo.org)) for additional guidance. For general guidance please see the BCO-DMO [Terms of Use](#) document.

**Version Date:** 2017-03-27

**Restricted:** No

**Validated:** Yes

**Current State:** Final no updates expected

**Data URL:** <https://www.bco-dmo.org/dataset/685783/data>

**Carbon flux for the Caribbean giant barrel sponge *Xestospongia muta* (Sponge-loop)**

**Expand/Collapse All**

**Archival Copy**



# Data Discovery & Access

- BCO-DMO data holdings are freely accessible to the public
- No login or account creation needed
- Discoverable via text and geospatial search interfaces

**BCO-DMO**  
Biological & Chemical Oceanography Data Management Office

DATA RESOURCES ABOUT US Enter search terms

**DATABASE**

Programs	39
Projects	916
Deployments	2,737
Platforms	578
<b>Datasets</b>	<b>9,168</b>
Instruments	469
Parameters	1,414
People	2,497
Affiliations	558
Funding	87
Awards	1,737

**Geospatial Access**

**Dataset Search**

carbon flux + Pawlik ⓘ Hide Advanced Search

**Collection Date**

Start: 1995 End: 2018

**Status**

Select a status

**Validated**

Yes

**Embargoed**

No


**Search** **Clear**


**Total: 137 (1 of 10)**

[+] Dataset	People	Award
[+] Carbon flux for the Caribbean giant barrel sponge <i>Xestospongia muta</i>	Principal Investigator	OCE-1558580

# Preservation

Once a project's data and metadata are published online at BCO-DMO, they are then submitted to an appropriate national data center for long-term preservation, e.g., the National Centers for Environmental Information (NCEI).

**NOAA** NATIONAL CENTERS FOR ENVIRONMENTAL INFORMATION  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION




Home Access Data Submit Data Public Outreach About

Search NCEI Data

Home > Data > Metadata > gov.noaa.nodc:0112166

BIOMASS, ANIMALS - INDIVIDUAL - COUNTS, SPECIES IDENTIFICATION, TAXONOMIC CODE and species abundance trawl data collected in the South Atlantic Ocean and South Pacific Ocean on the LAURENCE M. GOULD and NATHANIEL B. PALMER cruises LMG0104, LMG0203 and others as part of the Southern Ocean GLOBEC project from 2001-04-30 to 2002-09-08 (NCEI Accession 0112166)

  
Preview graphic

NODC Accession 0112166 includes biological and trawl data collected aboard the LAURENCE M. GOULD and NATHANIEL B. PALMER during cruises LMG0104, LMG0203, NBP0104 and NBP0204 in the South Atlantic Ocean and South Pacific Ocean from 2001-04-30 to 2002-09-08. These data include BIOMASS, ANIMALS - INDIVIDUAL - COUNTS, SPECIES IDENTIFICATION, TAXONOMIC CODE and species abundance. The instruments used to collect these data include Multiple Opening/Closing Net and Environmental Sensing System (MOCNESS). These data were collected by Jose Torres of University of South Florida as part of Southern Ocean GLOBEC. The Biological and Chemical Oceanography Data Management Office (BCO-DMO) submitted these data to NODC on 2013-07-24.

[Dataset Citation](#)

[Dataset Identifiers](#)

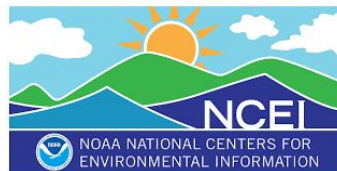
[ISO 19115-2 Metadata](#)

The following is the text of the abstract provided by BCO-DMO:

Fish abundance data from MOC-10 trawls.

[Show less](#)

AccessTime & LocationDocumentationDescriptionCreditKeywordsConstraintsLineage



# STEPS FOR DATA CONTRIBUTORS



# Data Type Considerations

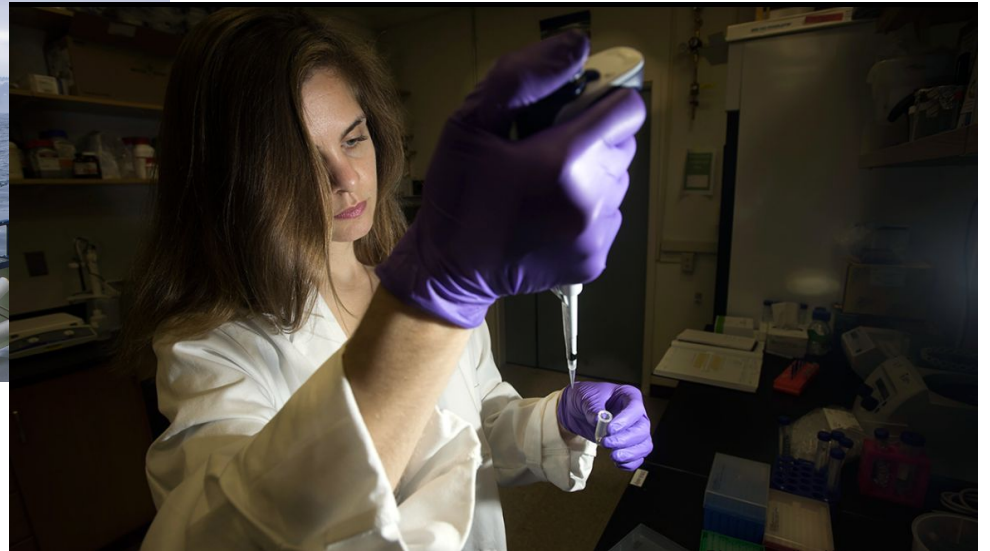
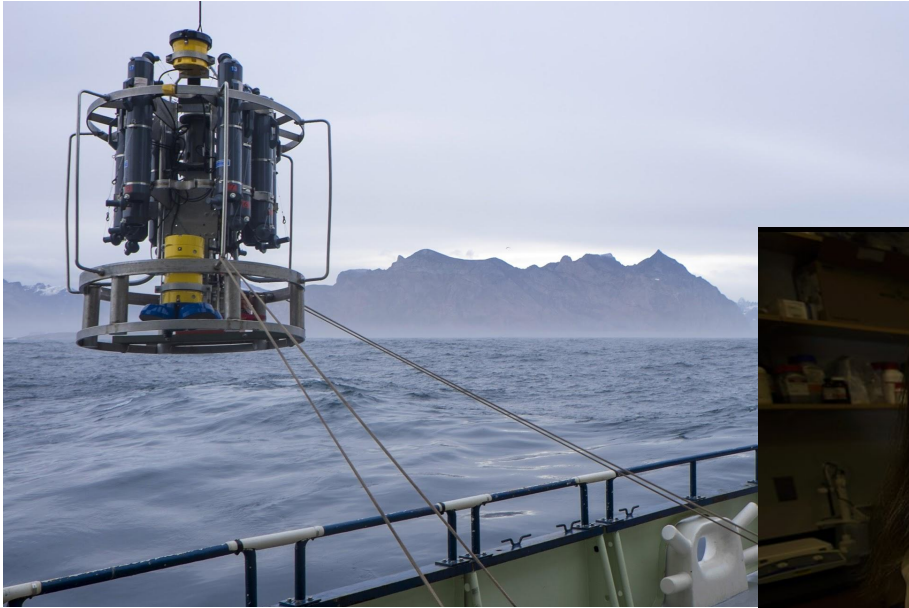


Photo credits: WHOI image bank

# Contributing Sequence Data

Sequences themselves are best served by specialized repositories, like NCBI's GenBank.

BCO-DMO serves the related environmental data and links out to NCBI, etc.

This allows all your project data to be discoverable from one place, but served by the domain repositories best suited to do so.

NCBI Resources How To

Nucleotide Nucleotide Advanced

The Nucleotide database will include EST and GSS sequences in early 2019. [Read more.](#)

GenBank Send to:

### Uncultured labyrinthulid clone BBW042908\_16 18S ribosomal RNA gene, partial sequence

GenBank: FJ800585.1

[FASTA](#) [Graphics](#) [PopSet](#)

---

[Go to:](#)

LOCUS	FJ800585	1363 bp	DNA	linear	ENV 28-MAR-2009
DEFINITION	Uncultured labyrinthulid clone BBW042908_16 18S ribosomal RNA gene, partial sequence.				
ACCESSION	FJ800585				
VERSION	FJ800585.1				
KEYWORDS	ENV.				
SOURCE	uncultured labyrinthulid				
ORGANISM	<a href="#">uncultured labyrinthulid</a> Eukaryota; Stramenopiles; Labyrinthulomycetes; environmental samples.				
REFERENCE	1 (bases 1 to 1363)				



# BCO-DMO

Biological & Chemical Oceanography Data Management Office

DATA

## DATABASE

New Entry

Programs

Projects

Deployments

Platforms

Datasets

Related Resources

Instruments

Parameters

People

Affiliations

Funding

Awards

Contact Status

Archive

Account:

Logout

Dataset: 16S rRNA sequence

/BCO-DMO/Microbe\_Ven

Directory

Documentation

Down

Level 0

Next Level

Flat Listing

```
# 16S rRNA sequence data at East Pacific Rise
# Alvin dives from RV Atlantis cruises, 2004
# PI: S. Sievert (WHOI)
# version: 2017-04-20
#
```

sample\_descrip

16S\_tags

cruise_id	date_deployed	date_recovered
AT11-07	2004-02-07	2004-02-16
AT11-07	2004-02-07	2004-02-16
AT11-07	2004-02-03	2004-02-16
AT11-07	2004-02-03	2004-02-16
AT11-07/AT11-10	2004-02-03	2004-04-19
AT11-07/AT11-20	2004-02-03	2004-11-12
AT11-07/AT11-20	2004-02-03	2004-11-22
AT15-06	nd	2006-06-27

sample\_descrip

16S\_clones

cruise_id	date_deployed	date_recovered
AT11-07/AT11-20	2004-02-03	2004-11-12
AT11-07/AT11-21	2004-02-03	2004-11-12

## GEOSPATIAL ACCESS

**Dataset Title:** GenBank accession numbers for microbial DNA from the Atlantic Ocean during R/V Atlantis research cruises (Jasper project)

BC<sup>2</sup>-DM

[DATA](#)
[RESOURCES](#)
[ABOUT US](#)

---

### DATABASE

New Entry	
Programs	45
<b>Projects</b>	<b>1,116</b>
Deployments	2,924
Platforms	603
Datasets	9,491
Related Resources	
Instruments	490
Parameters	1,420
People	2,786
Affiliations	601
Funding	94
Awards	2,092
Contact Status	270
Archive	1,226

Account: dkinkade  
 Logout

## Project: An Integrated Study of Energy Metabolism, Carbon Fixation, and Colonization Mechanisms in Chemosynthetic Microbial Communities at Deep-Sea Vents

[View](#) | 
 [Edit](#) | 
 [Delete](#) | 
 [Add new project](#) | 
 [Node Queues](#)

---

**Acronym/Short Name:**  
Microbial Communities at Deep-Sea Vents

**Start Date:** 2011-10  
**End Date:** 2014-09

**Datasets:** 14  
    **Collections:** 7  
**Deployments:** 9  
    **Cruises:** 7  
    **MannedSubmarine:** 2


**Programs:**  
[Dimensions of Biodiversity \[Dimensions of Biodiversity\]](#)  
[Center for Dark Energy Biosphere Investigations \[C-DEBI\]](#)

[Expand/Collapse All](#)

- [Description](#)
- ▾ [More Information](#)
- [Funding](#)
- ▾ [Dataset Collections](#)

Dataset Short Name	Full Dataset Title
16S rRNA sequence and collection data	GenBank accession numbers for microbial 16S rRNA sequences collected at the East Pacific Rise by DSV/Alvin during R/V Atlantis research cruises (Jan. 2004 - June 2006) (Microbial Communities at Deep-Sea Vents project)
Chemosynthetic biofilm diversity	Samples sequenced from chemosynthetic biofilm communities in deep-sea hydrothermal vents collected on the R/V Atlantis AT26-10 in the East Pacific Rise, Pacific Ocean from 2013 - 2014 (Microbial Communities at Deep-Sea Vents project)
Incubation in	Results from shipboard high pressure incubations of diffuse flow vent fluids collected from the

### GEOSPATIAL ACCESS



# Contributing Experimental Data

**BCO-DMO**  
Biological & Chemical Oceanography Data Management Office

DATA

RESOURCES

DATABASE

New Entry

Programs 45

Projects 1,116

Deployments 2,924

Platforms 603

Datasets 9,491

Related Resources

Instruments 490

Parameters 1,420

People 2,786

Affiliations 601

Funding 94

Awards 2,092


Contact Status 270

Archive 1,226

Account: dkinkade

Logout

GEOSPATIAL ACCESS




Dataset: Incubation in diffuse flow vent fluids

[View](#) [Edit](#) [Request a DOI](#) [Delete](#) [Revisions](#) [GCMD DIF Record](#) [Add](#)

Linked Data URI: <http://lod.bco-dmo.org/dataset/828993>

Get Data

[VIEW TABLE](#) [SUBSET DATA](#) [CSV](#) [TSV](#) [MATLAB](#) [netCDF](#)



Incubation in diffuse flow vent fluids - C

Spatial Extent: N:9.83992 E:-104.2915 S:9.83992 W:-104.2915

**Project:** An Integrated Study of Energy Metabolism, Carbon Fixation, and Chemosynthetic Microbial Communities at Deep-Sea Vents (M

**Principal Investigator:** Dr Dionysis Foustoukos (Carnegie Institution fo

**BCO-DMO Data Manager:** Nancy Copley (Woods Hole Oceanographic

**Version:** 2

**Version Date:** 2017-02-07

**Restricted:** No

**Validated:** Yes

**Current State:** Final no updates expected

**BCO-DMO Issue Tracking ID:** <http://redmine.bco-dmo.org/issues/1021>

**Data URL:**  
[http://dmoserv3.bco-dmo.org/g/serv/BCO-DMO/Dim\\_Biodiversity/crab\\_spa\\_incubation\\_v2.html0%7Bdir=dmoserv3.bco-dmo.org/g/info/BCO-DMO/Dim\\_Biodiversity/crab\\_spa\\_incubation%20%7D](http://dmoserv3.bco-dmo.org/g/serv/BCO-DMO/Dim_Biodiversity/crab_spa_incubation_v2.html0%7Bdir=dmoserv3.bco-dmo.org/g/info/BCO-DMO/Dim_Biodiversity/crab_spa_incubation%20%7D)

**/BCO-DMO/Dim\_Biodiversity/crab\_spa\_incubation\_v2 ---- Level 3**

[Directory](#) [Documentation](#) [Download & Other Operations](#)

[Level 0](#) [Next Level](#) [Flat Listing](#)

```
# Microbial incubations in diffuse flow vent fluids
# D. Foustoukos

# version: 2017-02-07 (added cell concentration and d15N data)
# replaces version: 2015-12-17
#
```

description	date_start	date_end	flow_rate
Crab_spa_diffuse_flow_fluids	2014-01-03	2014-01-20	0.042

temp
30

press
25

time_elapsed	cell_concentration	NO3_uM	NH4_uM	H2_uM	H2S_uM	CH4_uM	pH	d15N_NO3_ppt	d15N_Biomass_ppt
0	nd	12.8	9.9	nd	109	5.1	5.8	nd	nd
19	nd	11.6	7.4	0.13	nd	5.1	5.8	nd	nd
27	nd	13.6	10.8	nd	0.7	nd	6.4	nd	nd
44	nd	6.7	nd	nd	nd	nd	nd	2.1	nd
47	1420000	12.9	nd	nd	28.1	nd	nd	-2.3	nd
53	2720000	419	12.0	nd	nd	3.8	nd	6.1	nd
57	3805000	417	nd	nd	nd	nd	nd	nd	nd
68	6635000	1568	1.7	0.12	nd	nd	nd	5.15	nd
77	8825000	1289	1.4	nd	nd	nd	nd	5.10	nd
90	7270000	592	nd	nd	nd	nd	6.4	nd	nd
99	6980000	141	5.5	4.60	nd	nd	6.5	6.2	nd
106	5810000	105	23.2	0.10	nd	nd	nd	nd	nd
114	7380000	80	5.1	nd	nd	nd	5.5	8.1	-0.5

press
5

time_elapsed	cell_concentration	NO3_uM	NH4_uM	H2_uM	H2S_uM	CH4_uM	pH	d15N_NO3_ppt	d15N_Biomass_ppt
123	2550000	12.3	5.2	nd	nd	nd	5.8	nd	nd
133	4350000	5.3	12.3	nd	nd	nd	6	nd	nd

# Taxonomy - WoRMs

The World Register of Marine Species (WoRMs) provides an authoritative and comprehensive list of names of marine organisms, including information on synonymy. **/BCO-DMO/Southern\_Ocean\_Pinnipeds/fossil\_seal\_aa\_isotopes ---- Level 0**

[Directory](#)
[Documentation](#)
[Download & Other Operations](#)

[Level 0](#)
[Next Level](#)
[Flat Listing](#)

# Fossil Seal Amino Acid Isotopes

# PIs: Paul L. Koch (UC Santa Cruz) & Brenda Hall (UMaine)

# Co-PIs: Daniel P. Costa (UC Santa Cruz) & A. Rus Hoelzel (Durham University)

# Version: 26 March 2018

=====

Common\_name

Scientific\_name

WoRMS\_LSID

AphiaID

-----

Crabeater\_seal

Lobodon\_carcinophaga

urn:lsid:marinespecies.org:taxname:231416

231416

Southern\_elephant\_seal

Mirounga\_leonina

urn:lsid:marinespecies.org:taxname:231413

231413

Weddell\_seal

Leptonychotes\_weddellii

urn:lsid:marinespecies.org:taxname:195932

195932

We recommend checking species names against WoRMs and including identifiers in your data when possible.

# Taxonomy - NCBI for Microbial taxa and other IDs

The NCBI Taxonomy Database provides a source for names of marine microorganisms. Other NCBI databases can be linked to information on molecule models, protein IDs, etc.

## /BCO-DMO/En-Gen\_DMSP\_Cycling/DMSP\_d

[Directory](#) [Documentation](#) [Download & Other Operations](#)

[Level 0](#) [Next Level](#) [Flat Listing](#)

# Links to published DMSP-dependent protein structures in *P. ubique*  
# at NCBI Molecular Modeling Database (MMDB)  
# PI: Mary Ann Moran (UGA)  
# Co-PIs: Ronald Kiene (DISL) & William Whitman (UGA)  
# Notes: MMDB\_ID links open in new window/tab. PDB\_ID = Protein Data Bank ID.  
# Version: 19 Nov 2012

protein_name	taxon	strain	PDB_ID	MMDB_ID
Demethylase_With_Cofactor_THF	Pelagibacter_ubique	HTCC1062	3TFJ	96080
Demethylase_With_Substrate_Dmsp	Pelagibacter_ubique	HTCC1062	3TFI	96079
Demethylase_APO	Pelagibacter_ubique	HTCC1062	3TFH	96078

NCBI Taxonomy Browser

Search for: *Candidatus Pelagibacter ubique* [as: complete] lock Go Clear

levels using filter: none

**Candidatus Pelagibacter ubique** 1)

taxonomy ID: 198252 (for references in articles please use NCBI:txid:198252)

current name: "*Candidatus Pelagibacter ubique*" Rappe et al. 2002, candidatus name<sup>1)</sup> reference strain of "*Candidatus Pelagibacter ubique*": HTCC:1062 [equivalent: *Pelagibacter ubique*]

NCBI BLAST name: a-proteobacteria  
Rank: species  
Genetic code: Translation table 11 (Bacterial, Archaeal and Plant Plastid)

Lineage (full )  
cellular organisms: Bacteria; Proteobacteria; Alphaproteobacteria; Pelagibacterales; Pelagibacteraceae; Candidatus Pelagibacter

Database name	Subtree links	Direct links	Links from type
Nucleotide	3,305	3,037	14
Protein	28,020	23,254	-
Structure	11	-	-
Genome	1	1	-
Popset	13	13	-
GEO Datasets	157	13	-
PubMed Central	55	55	-
Gene	1,392	1	-
SRA Experiments	26	4	-
Protein Clusters	1,321	1,321	-
Identical Protein Groups	23,865	23,240	-
Bio Project	23	2	-
Bio Sample	59	28	13
Bio Systems	156	-	-
Assembly	34	23	1
Taxonomy	14	1	-

Notes:

1) A provisional name for well characterised but as-yet uncultured organisms.

Comments and References:

PubMed Murray, R.G. & Schleifer, K.H. (1994) "Taxonomic notes: a proposal for recording the properties of putative taxa of procaryotes." Int. J. Syst. Bacteriol. (1994) 44:174-176.

PubMed Murray, R.G., and Stackebrandt, E. (1995) "Taxonomic note: implementation of the provisional status Candidatus for incompletely described procaryotes." Int. J. Syst. Bacteriol. (1995) 45:186-187.

Drag symbols to move  
Double click symbols to explore molecules  
Download Structure Data ?



# International Geo Sample Numbers (IGSNs)

The IGSN is a persistent unique identifier for physical samples and specimens that eliminates the problems associated with the ambiguous naming of samples. In the U.S., you can obtain IGSNs using the System for Earth Sample Registration (SESAR) at IEDA Data Facility.

See <https://igsn.github.io/overview/> and <http://www.geosamples.org/>

 Search IGSN[HOME](#)[ABOUT THE IGSN](#)[SERVICES](#)[SAMPLES](#)[NEWS](#)[HELP](#)[ABOUT US](#)[LOG IN TO MYSESAR](#)

## get your igsn

Register your samples with SESAR to obtain IGSNs for unique sample identification.

## search the catalog

Search the SESAR catalog to find registered samples and their current location.

## sample curation

Learn about the DESC initiative to build a Digital Environment for Sample Curation.

## interoperability

Access IGSN metadata profiles and register samples via web services.

## new user?

Get a MySESAR account to register your samples.

# Event Logs



R2R

ROLLING DECK TO REPOSITORY

A chronological record of all scientific sampling events that happened during a cruise, wherein each sampling event is assigned a unique identifier.

- Event #: unique to the cruise
- Instrument type/name/model
- Station #
- Cast # (if applicable)
- Date and time (UTC or local + time zone)
- Latitude and longitude
- Sampling depth
- Depth of the water
- Investigator
- Notes/comments

The event log allows investigators to integrate data from different sampling devices used during a cruise.

## Scientific Sampling Event Log

The R2R Event Logger is installed on many R/Vs and GLS vessels.

The R2R Eventlogger is a program that creates a log of the scientific sampling events that occurred during a cruise. Final log can be downloaded as in csv format.

Gareth Lawson, Gulf of Maine krill, September 22 - October 1, 2010, all entries													
Event   Instrument   Action   Transect   Station   Cast   time   Local   Latitude   Longitude   Depth   12Khz   Author													
Comment													
Revisions													
20100922.0905	Ship	crude start	N/A	N/A	N/A	9:01 AM	41.492217	-71.4187	N/A	N/A	N/A	glawson	glawson 6 22 Sep 2010 16:51
20100922.1048	GreenBomber	deploy	N/A	N/A	1	10:48 AM	41.42265	-71.409033	N/A	N/A	N/A	glawson	test deployment glawson 6 23 Sep 2010 19:46
20100922.1122	Hammarhead	deploy	N/A	N/A	1	11:22 AM	41.411083	-71.41975	N/A	N/A	N/A	glawson	test deployment glawson 6 23 Sep 2010 19:47
20100922.1249	Ship	On Station	N/A	N/A	N/A	12:49 PM	41.32265	-71.4336	N/A	N/A	N/A	glawson	station #0 glawson 6 22 Sep 2010 16:56
20100922.1308	VR	deploy	N/A	N/A	1	1:08 PM	41.315567	-71.430433	N/A	N/A	N/A	glawson	test deployment glawson 6 23 Sep 2010 18:55
20100922.1316	VR	recover	N/A	N/A	1	1:16 PM	41.312783	-71.430417	N/A	N/A	N/A	glawson	test recovery glawson 6 23 Sep 2010 18:57
20100922.1330	Hammarhead	recover	N/A	N/A	1	1:30 PM	41.308267	-71.431083	N/A	N/A	N/A	glawson	test recovery glawson 6 23 Sep 2010 19:47
20100922.1358	GreenBomber	recover	N/A	N/A	1	1:58 PM	41.30295	-71.433433	N/A	N/A	N/A	glawson	test recovery glawson 6 23 Sep 2010 19:46
20100922.1415	Ship	SafetyDriftStart	N/A	N/A	N/A	2:15 PM	41.3008	-71.4231	25.31			glawson	meeting in the gallery glawson 6 23 Sep 2010 18:15
20100922.1525	Ship	SafetyDriftEnd	N/A	N/A	N/A	3:25 PM	41.333283	-71.1227	28.54			glawson	glawson 6 22 Sep 2010 19:25
20100922.1534	Observer/Mammals	start	N/A	N/A	N/A	7:34 PM	41.337633	-71.087	28.11			jvanderkoop	Test Observer Protocol
20100922.1613	Observer/Mammals	end	N/A	N/A	N/A	8:13 PM	41.363433	-70.930633	33.55			jvanderkoop	Test Observer Protocol
20100923.0640	GreenBomber	deploy	N/A	N/A	2	6:40 AM	41.99695	-67.630183	N/A	N/A	N/A	glawson	latlon feed not working according to ship, latlon is 41 59.817 N and 67 37.811 W glawson 6 25 Sep 2010 22:01
20100923.0653	Hammarhead	deploy	N/A	N/A	2	6:55 AM	42.00107	-67.63275	N/A	N/A	N/A	glawson	latlon feed not working according to ship, latlon is 42 00.064 N and 67 37.865 W glawson 6 25 Sep 2010 22:15
20100923.0703	ADCP75	start	N/A	N/A	N/A	7:03 AM	42.0074	-67.6374	N/A	N/A	N/A	glawson	starting it with external trigger (lat lon is 42 00.444 N and 67 38.244 W) glawson 6 25 Sep 2010 22:16
20100923.0723	Observer/Mammals	start	N/A	N/A	1	7:23 AM	42.023617	-67.64605	N/A	N/A	N/A	glawson	

<https://www.rvdata.us/about/event-log>

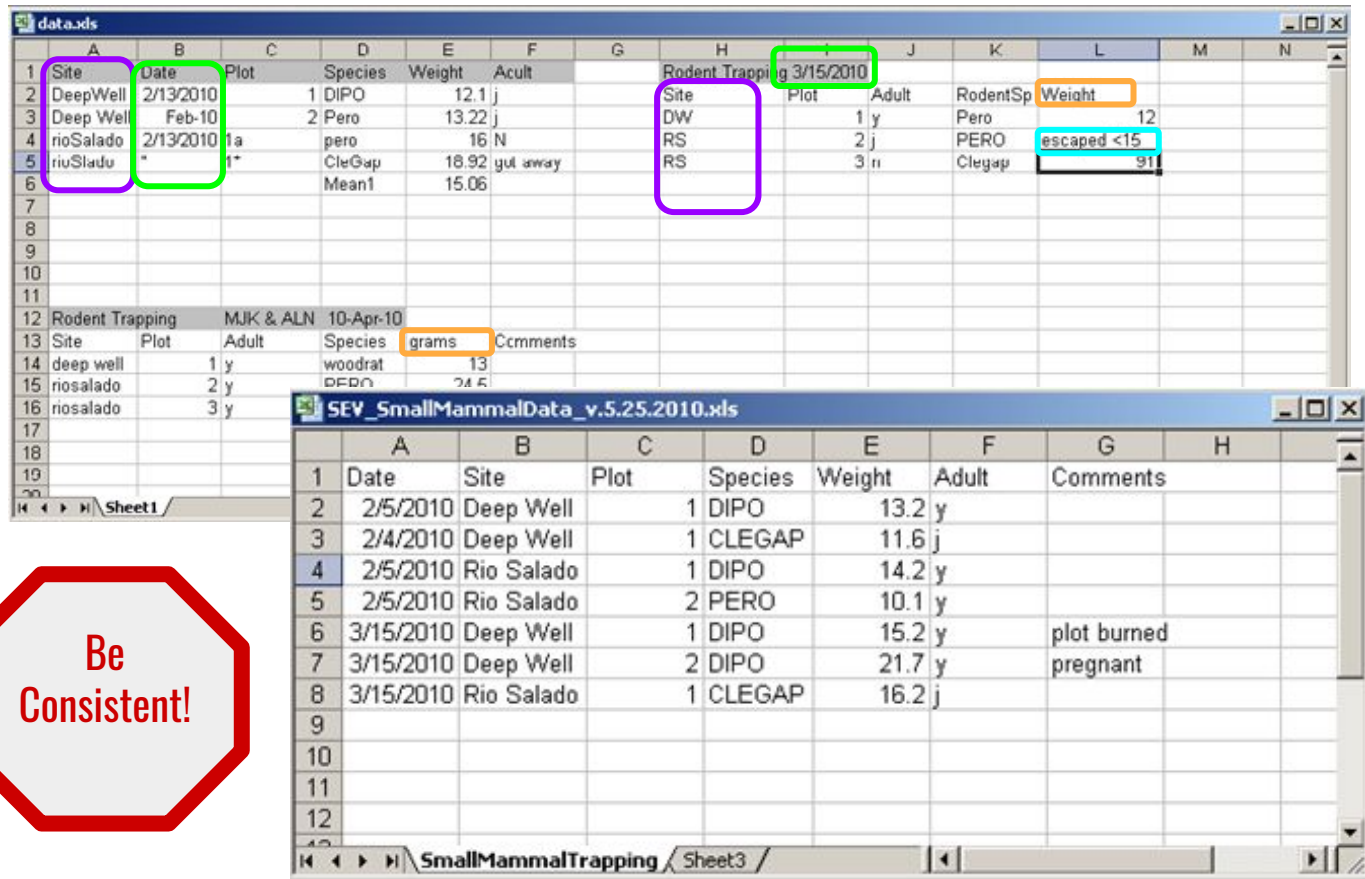


# Data Preparation Tips...

Columns of data are consistent: only numbers, dates, or text

Consistent names, codes, formats (e.g., date) used in each column.

Data all in one table, which is much easier for a statistical program to work with than multiple small tables which each require human intervention.



**data.xls**

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Site	Date	Plot	Species	Weight	Adult		Rodent Trapping	g 3/15/2010					
2	DeepWell	2/13/2010		1 DIPO	12.1	j		Site				Weight		
3	Deep Well	Feb-10		2 Pero	13.22	j		Plot		Adult	RodentSp		12	
4	rioSalado	2/13/2010	1a	pero	16	N		DW		1 y	Pero			
5	riuSladu	*	1*	CleGap	18.92	gut away		RS		2 j	PERO	escaped <15		
6				Mean1	15.06			RS		3 n	Clegap		91	

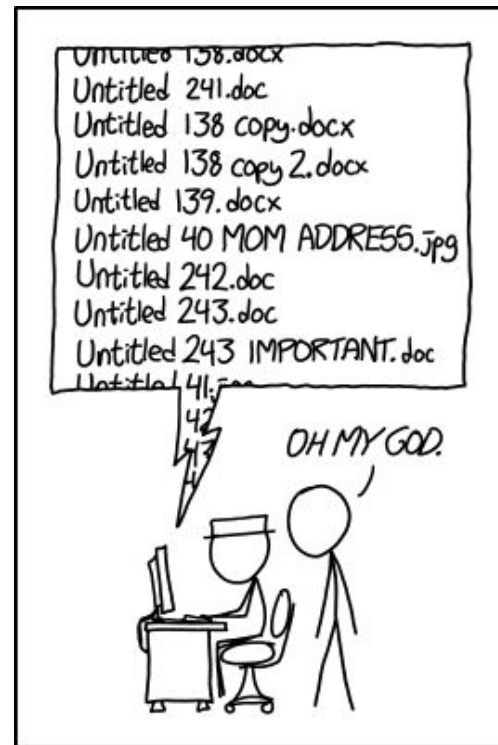
**SEV\_SmallMammalData\_v.5.25.2010.xls**

	A	B	C	D	E	F	G	H
1	Date	Site	Plot	Species	Weight	Adult	Comments	
2	2/5/2010	Deep Well		1 DIPO	13.2	y		
3	2/4/2010	Deep Well		1 CLEGAP	11.6	j		
4	2/5/2010	Rio Salado		1 DIPO	14.2	y		
5	2/5/2010	Rio Salado		2 PERO	10.1	y		
6	3/15/2010	Deep Well		1 DIPO	15.2	y	plot burned	
7	3/15/2010	Deep Well		2 DIPO	21.7	y	pregnant	
8	3/15/2010	Rio Salado		1 CLEGAP	16.2	j		

**SmallMammalTrapping / Sheet3**

# Data Formatting Best Practices

- Create descriptive column names without spaces or special characters. Use underscores instead of symbols.
  - Avoid using numbers at the beginning of a column name (some programs have trouble with this)
  - E.g., Temp 30 meters → **Temp\_30\_m**
  - E.g., Species Code → **species\_code**
- Use descriptive file names to provide useful information about the data.
  - Consistent naming allows for sorting and organizing files (esp. images and video).
    - E.g., **PIV\_E\_gracilis\_20180524.csv** (type = Particle Image Velocimetry, species = E. gracilis, date= May 24, 2018).
    - E.g., **KM1104\_12\_1.csv** (CTD files containing cruiseID\_station\_cast.csv)



PROTIP: NEVER LOOK IN SOMEONE ELSE'S DOCUMENTS FOLDER.

# Data Formatting Best Practices

- Missing Data:
  - Again, be consistent!
  - Blank cells have no meaning...use "nd" or "NaN" (-999)
  - Bear in mind that "0" has meaning (0 = measured and not found as opposed to "not measured")
- Round data to appropriate number of decimal places for given property
- Document all codes and quality flag definitions/conventions in the metadata
- Don't rely on Excel formatting to convey meaning (e.g. colored cells)



\*Any/all data: include lat/lon, date, time, and depth whenever possible.

# Additional Resources

- BCO-DMO: <https://www.bco-dmo.org/resources> (Metadata Forms, DMP Template, BCO-DMO Quick Guide)
- R2R: <https://www.rvdata.us/>
- NCBI Taxonomy Database: <https://www.ncbi.nlm.nih.gov/taxonomy>
- World Register of Marine Species: <http://www.marinespecies.org/index.php>
- IGSN: <http://www.geosamples.org/>
- Data Management Short Course: <http://commons.esipfed.org/datamanagementshortcourse>

# Questions?

[info@bco-dmo.org](mailto:info@bco-dmo.org)  
[www.bcodmo.org](http://www.bcodmo.org)



(Lawson, 2002)